

# Two New Records of *Eupithecia* (Lepidoptera: Geometridae) from Korea

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## ABSTRACT

We report two species of *Eupithecia* for the first time from Korea. Two females of *Eupithecia sophia* Butler were collected from Jeju Island and Sobaeksan Mt., Danyang, and two males of *Eupithecia nipponaria* Inoue were collected from Duryunsan Mt., Haenam. Up to now, a total of 51 species of *Eupithecia* are recorded from Korea. Diagnosis and description of each species are given with the figures of genitalia.

**Key words:** Geometridae, *Eupithecia*, Lepidoptera, taxonomy, Korea

## INTRODUCTION

The genus *Eupithecia* Curtis is one of the most species-rich taxa of Lepidoptera, comprising more than 1,300 species worldwide (Scoble, 1999). They can be recognized by slender forewing with projected apex, indistinct basal, ante- and postmedial transverse lines with definite discal spot on forewing, two pairs of spurs on hindtibia (Mironov, 2003). The eighth male abdomen has a distinct sclerotized plate (=oc-tave) on sternite. The male genitalia are recognized by the membranous, tapering uncus with one or two tips, slender membranous valva often with ventral process, labidies with anterior arms apically digitiform, juxta broadest transversely with two narrow apical lobes, and aedeagus with one or more variously shaped cornuti (Mironov, 2003). The female genitalia are recognized by membranous papillae anales, ductus bursae with a well-developed colliculum, and corpus bursae covered with numerous signa and different position of ductus seminalis.

In Korea, Herz (1904) first described 4 species of *Eupithecia*. Since Herz, a total of 49 species of *Eupithecia* are recorded from the Korean Peninsula (Oh, 1992, 1993; Shin, 1996; Byun et al., 1998; Choi, 2003). The purpose of the present study was to report two additional species of *Eupithecia* from Korea.

Examination of adults including male and female genitalia refers to Scoble (1992). Abbreviations are as follows: JN: Province Jeollanam-do, JJ: Province Jeju-do, CB: Province

Chungcheongbuk-do, MNU: Mokpo National University.

## SYSTEMATIC ACCOUNTS

Order Lepidoptera Linnaeus, 1758

Family Geometridae Stephens, 1829

Subfamily Larentiinae Duponchel, 1845

Genus *Eupithecia* Curtis, 1825

*Eupithecia* Curtis, 1825: 64. Type species: *Phalaena absinthiata* Clerck.

<sup>1</sup>\**Eupithecia sophia* Butler (Figs. 1A, 2B)

*Eupithecia sophia* Butler, 1878: 444 (TL: JAPAN, Yokohama).

*Eupithecia jezonica* Matsumura, 1927: 184 (TL: JAPAN, Hokkaido).

*Eupithecia sophia* ab. *simplex* Dietze, 1910: pl. 361.

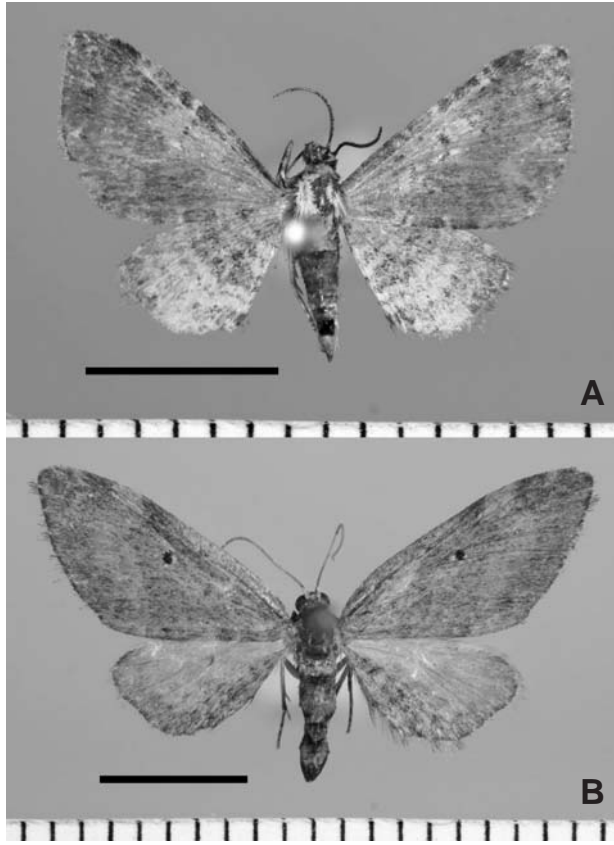
*Eupithecia sophia* ab. *griseipars* Prout, 1938: 194.

*Material examined.* [CB] 1 ♀ Sobaek san Mt., CB: Danyang, 128° 31'E, 37° 01'N, 280 m, 21 Jul. 2005 (S.-W. Choi); [JJ] 1 ♀ Tamra University, JJ: Seoguipo, 24 Sep. 2008 (S.-S. Kim).

*Diagnosis.* This species is externally similar to *Eupithecia tabidaria* Inoue in the smaller wingspan and central fascia of forewing, but can be distinguished by the medial whitish band on central fascia and more slanted postmedial line of forewing and basally and medially whitish hindwing. The male genitalia can be diagnosed by the lack of uncus, simple membranous valva with smooth ventral margin, and slender aedeagus with a short stick-like cornutus (Inoue, 1979). The

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**Fig. 1.** Adults of *Eupithecia* new to Korea. A, *E. sophia* Butler; B, *E. niphonaria* Inoue. Scale bars=5 mm (A, B).

female genitalia can be diagnosed by the long posterior apophyses, simple ostium bursae, long ductus bursae with a colliculum and oval corpus bursae with a relatively thick ductus seminalis near the junction of ductus bursae.

**Description.** Wingspan 13-14 mm. Antennae filiform; frons broad, trapezoidal, mixed with whitish and dark brownish scales; labial palpi moderate, being the same as the eye diameter, largely expanded at middle part. Body and legs covered with whitish scales. Forewing ground color grayish, central fascia with multiple transverse lines, medially whitish and dark discoidal dot, one areole; subtermen with dark grayish and whitish line; termen dark grayish. Hindwing ground color whitish; basal, medial and subtermen with grayish transverse lines.

**Female genitalia** (Fig. 2A). Simple papillae anales; posterior apophyses long, about 1.5 times of anterior apophyses; ostium bursae simple, membranous; ductus bursae long, about the longitudinal diameter of corpus bursae, membranous, anterior with a colliculum; corpus bursae ovate, cover-

ed with two large signa patches; ductus seminalis relatively thick, located near the junction between ductus and corpus bursae.

**Biology.** The species is multivoltine in Japan (Inoue, 1979).

**Distribution.** Korea, Japan, West China.

**<sup>1</sup>\**Eupithecia niphonaria* Leech (Figs. 1B, 2B-D)**

*Eupithecia niphonaria* Leech, 1897: 68 (TL: JAPAN).

*Eupithecia draudti* Dietze, 1913: 148, pl. 85: 962, 963 (TL: JAPAN, Tokyo).

*Eupithecia corticosa* Prout, 1914: 296 (TL: JAPAN, Tokyo).

*Eupithecia maenamii* Inoue, 1965: 105 (TL: JAPAN, Takao-san, Tokyo).

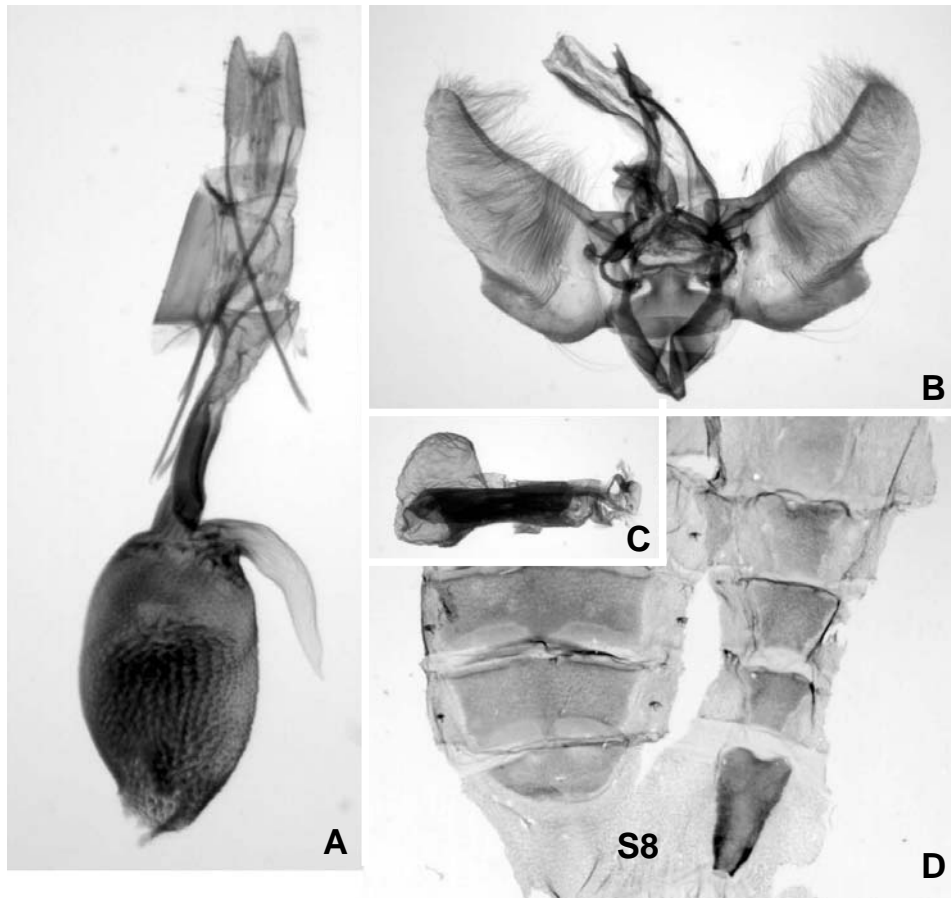
**Material examined.** [JN] 2♂ Duryun san Mt., JN: Haenam, 126° 37'E, 34° 28'N, 28 Apr. 2003 (S.-W. Choi).

**Diagnosis.** This species is externally similar to *E. clavifera* Inoue in the dark grayish transverse central fascia of forewing, but can be distinguished by the larger wingspan, relatively broad and paler subtermen of forewing. The male genitalia of *E. niphonaria* are diagnosed by the bifurcated tip of uncus, well developed subsclaphium, slender valva with broad sacculus and large saccus. The male genitalia are similar to *E. proterva* Butler in the shape of sacculus and aedeagus with vesica, but can be distinguished by the shape of bifurcated uncus and less projected sacculus of valva and the rounded anterior arm of octave on male 8<sup>th</sup> sternite. The female genitalia of *E. niphonaria* can be diagnosed by the simple papillae anales, long posterior apophyses, about twice the anterior apophyses, half-rounded sclerotized ostium bursae, short ductus bursae with a colliculum and ovate corpus bursae with a densely covered signa and centrally located ductus seminalis (Inoue, 1979).

**Description.** Wingspan 18-21 mm. Antennae filiform; frons relatively narrow, mixed with dark ochereous and pale ochereous scales; labial palpi covered with dark ochereous scales, medially with long hairs, slightly longer than eye diameter. Body and legs covered with whitish scales. Forewing ground color ochereous; basal and centrally dark ochereous or grayish, postmedial line costally concave, medially slightly projected and slanted, discoidal dot blackish, one areole; ochereous between central fascia and subtermen; termen dark grayish. Hindwing whitish; centrally with multiple transverse lines; termen dark grayish.

**Male abdomen and genitalia** (Figs. 2B-D). Abdominal 8<sup>th</sup> sternite slender octave with a pair of broad anterior arms and a pair of minute posterior tip; uncus tip bifurcated, tapering; subsclaphium developed; labidies slender, inwardly curved and medially united; juxta broad, medially strongly project-

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**Fig. 2.** Male and female genitalia. A, female genitalia of *E. sophia*; B, male genitalia of *E. niphonaria*; C, aedeagus of *E. niphonaria*; D, male abdomen of *E. niphonaria*. S8, 8<sup>th</sup> sternite.

ed. Valva membranous, slender; costa thinly sclerotized, basally strongly expanded; sacculus broadly expanded process; saccus anteriorly strongly projected. Aedeagus slender; vesica tubular with a line of minute cornuti.

*Biology.* This species is flying in April and feeds on *Quercus phylliraeoides* (Fagaceae) (Inoue, 1979).

*Distribution.* Korea, Japan.

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